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COAL BEDS IN ELK COUNTY, PENNSYLVANIA

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Introduction.

Elk County is the largest producer of bituminous coal in northern Pennsylvania, and in 1918 stood seventeenth among all bituminous coal producing counties in Pennsylvania. In that year 968,868 tons were produced, valued at $2,767,131; 922,401 tons, valued at $2,637,336, were loaded at the mines for shipment; 24,663 tons, valued at $70,010, were sold to local trade and used by employees; 21,804, valued at $59,785 were used at the mines for steam and heat. None of the coal was made into coke at the mines.

There are ten mineable coal beds in Elk County. The Lower Kittanning (Dagus) coal is the most important, and the Clarion (Clermont) ranks second. The remainder are locally of value, but are seldom mined for shipping coal.

Elk County is bounded on the north by McKean County, on the east by Cameron County, on the south by Clearfield and Jefferson counties, and on the west by Forest County. Its area is 781 square miles; its greatest width from east to west is 43.5 miles, and from north to south is 29 miles. Its population in 1920 was 34,981.

Elk County is well served by railroads. The Pennsylvania Railroad crosses the county from north to south and east to west, and follows Bennetts Branch across the southeast corner. The Buffalo and Susquehanna also follows Bennetts Branch across this corner of the county. The Pittsburgh, Shawmut and Northern Railroad crosses the eastern part of the county from north to south, has a few miles of track between Irwintown and Croyland, also branches, and trackage rights on parts of the Erie Railroad. The Buffalo, Rochester and

Pittsburgh Railroad from Clarion Junction to the southwest boundary and the Erie Railroad from Clarion Junction to the northern boundary make a continuous line across the county and use each others tracks. The Erie Railroad also has a few miles of track on Little Toby Creek in the south central part of the county.

STRUCTURE.

The coal-bearing rocks of Elk County lie nearly flat, capping the plateau along the axis of four minor synclines. The first of these structural basins follows Bennetts Branch of the Susquehanna near Caledonia and Benezette; the second passes through Shawmut and Brockport and extends along Little Toby and Elk Creeks; the third lies near Lake City, Ridgway, and St. Moran and continues northeast; the fourth follows the same general direction through Spring Creek, Summit and Highland. A considerable area of coal is preserved in these shallow basins, particularly the coals in the lower Allegheny and Pottsville formations.

STRATIGRAPHY.

The outcropping consolidated rocks of Elk County are the Allegheny, Pottsville and Mauch Chunk formations of Carboniferous age, and the Pocono and Catskill formations of Devonian age.

The Allegheny formation is composed of massive sandstones, shales, limestones, clays, and several coal beds.

The Pottsville formation is composed of massive sandstones, a few shales and three unimportant coal beds.

The Mauch Chunk, Pocono and Catskill formations are composed of sandstone and shale, and are not coal bearing.

COAL BEDS.

Pottsville coals. Three coal beds in the Pottsville formation, approximately at the horizon of the Mercer coals, are known locally as the "Alton coals." Although these beds are generally thin, and high in ash and sulphur, in some places they are thick enough to be mined.

One of these beds is locally 3 feet thick on Canal Run, but is high in sulphur and ash. On Sterling Run and its branches the Alton coals have been opened; the upper one is reported 3 feet 8 inches thick and very high in sulphur; the middle coal is 18 inches thick, and the lower, 3 feet.

At St. Marys the upper coal is 2 feet 7 inches thick, and the lower one 3 feet thick. They are full of bone and pyrite. These coals were once opened northwest of St. Marys. They average less than 2 feet thick, and are dirty.

The Alton coals have been opened on Spring Run, north of Benezette, where the upper coal is about 2 feet 9 inches thick. On Antens Run both the upper and lower Alton coals range from 2 to 4 feet thick. Their quality is very poor.

In Jay township the middle Alton coal is locally 3 feet 10 inches thick, and is good clean coal. It has been mined on Spring Run and near Weedville.

In Fox township the upper Alton coal is divided into three benches, 14, 18 and 20 inches thick, by partings about 3 inches thick. The lower coal is separated into two benches 20 and 15 inches thick by a shale parting 2 to 3 inches thick. The upper bench is the better coal. Along Laurel Run the upper coal is 2 feet 6 inches thick, and the lower one 3 feet thick.

In Jones, Ridgway and Spring Creek townships the upper Alton coal is locally 3 feet thick and the lower, 3 feet 6 inches thick.

In the vicinity of Montmorency these coals are from 3 to 4 feet thick, and are parted by numerous bands of bone coal. In Spring Creek township the upper Alton coal is locally 4 feet 5 inches thick, and is parted into two benches by 4 inches of shale, 8 inches above the bottom. On top of these benches is a bony bench 18 inches thick. The lower Alton coal has good quality and is 2 feet thick. It is capped by 2 feet of shale and bony coal.

These coals are extremely high in ash and sulphur, and at present are worked only for local fuel. It is doubtful if they will ever be important as shipping coals.

Clermont coal. A coal lying directly above the Pottsville sandstone or separated from it by a few feet of shale, was correlated as the Clarion coal by the Second Geological Survey. There is reason to believe that this bed may be the Brookville coal, and until further detailed work is done in this region, its correlation will be uncertain.

This bed, lying about 80 feet below the Lower Kittanning and locally 5 feet 6 inches thick, is one of the important coals in the county. Its quality is variable but generally the coal is rather high in ash and sulphur.

In Benezette and Jay townships the Clermont coal ranges from 2 feet to 5 feet 3 inches thick. Where thickest it generally carries several thin bone partings. It has been mined in many places for local use.

This coal has been mined extensively in Benzinger township. In the vicinity of St. Marys it is 3 feet thick, including 6 inches of bone coal, 6 inches from the top. The coal is high in ash and sulphur.

The Clermont bed is less than 2 feet thick in the northern and western townships. It has also been eroded in large areas.

Lower Kittanning ("B", Dagus) coal. The Lower Kittanning is the most important and extensively mined coal in Elk County, forming fully 90 per cent of the production. It ranges from 2 to 5 feet thick, averaging about 3 feet.

The Lower Kittanning is mined extensively on Bennetts Branch in Benezette and Jay townships. It ranges from 2 feet 6 inches to 3 feet 4 inches thick, averaging 2 feet 10 inches. In some places the coal is clean, but generally it carries many streaks of bone and pyrite. It is 2 feet 10 inches thick at Dents Run, and 3 feet 4 inches at Benezette; at Averyville 3 feet 2 inches, including a 6 inch binder of black slate, 8 inches from the top. It is 3 feet 2 inches thick at Weedville. At Tyler, Force and Major the coal is persistently 3 feet 4 inches thick, including 4 inches of bony coal at the top.

The Lower Kittanning is mined extensively at Kersey, Dagus and Toby Mines in Fox township. It ranges from 2 feet 6 inches to 3 feet 6 inches thick, averaging about 3 feet. It carries a "sulphur binder" $\frac{1}{4}$ inch thick, 2 feet above the bottom.

The Lower Kittanning is mined on the Pittsburgh, Shawmut and Northern, and the Erie Railroads in Horton township. It is 3 feet 2 inches thick at Brandy Camp, not including a top bony bench from 2 to 6 inches thick. It is 2 feet 10 inches thick at Cuneo, and 3 feet thick at Elbon. The coal is free from partings and binders, but locally carries a few inches of bone at the top.

In Benzinger township the Lower Kittanning coal ranges from 2 feet 10 inches to 3 feet 6 inches thick, but is high in sulphur and ash.

In Jones, Ridgway and Spring Creek townships the coal ranges from 2 feet to 3 feet 2 inches thick. The coal is high in sulphur, and roof rolls makes mining uncertain.

The Lower Kittanning coal is soft, but makes fair sized lumps when properly mined. It has a bright lustre and imperfect cubical cleavage. It averages about 31 per cent volatile matter, 59 per cent fixed carbon, 7 per cent ash, and 2.5 per cent sulphur.

Middle Kittanning ("C") coal. This bed, lying about 50 feet above the Lower Kittanning, is thin and unimportant in Elk County. It is locally 3 feet thick, but averages less than 12 inches.

Upper Kittanning ("C'") coal. The Upper Kittanning coal, lying about 40 feet above the Middle Kittanning coal, is a thin seam averaging about 9 inches thick. It is entirely lacking in large areas, and has never been opened.

Lower Freeport ("D") coal. The Lower Freeport coal is everywhere thin and unimportant in the county, except in the northeastern extension of the Reynoldsville basin in Horton and Fox townships. Here it is 3 feet to 4 feet 6 inches thick, and is generally without partings or binders.

Upper Freeport ("E") coal. This coal, lying about 45 feet above the Lower Freeport, has been largely eroded, being present only as isolated patches in the hills in the southern part of the county. It is usually a thick bed, locally measuring 6 feet, but commonly occurring in two 3-foot benches, separated by 6 to 20 feet of shale.